



TRMM Data Service Update

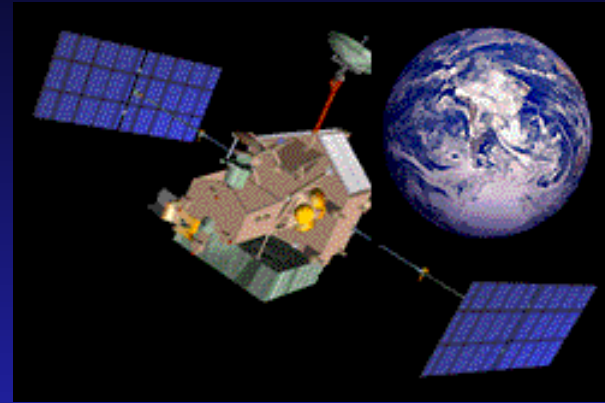
Zhong Liu, Dana Ostrenga and
Gregory Leptoukh

NASA Goddard Earth Sciences Data
and Information Center (GES DISC)

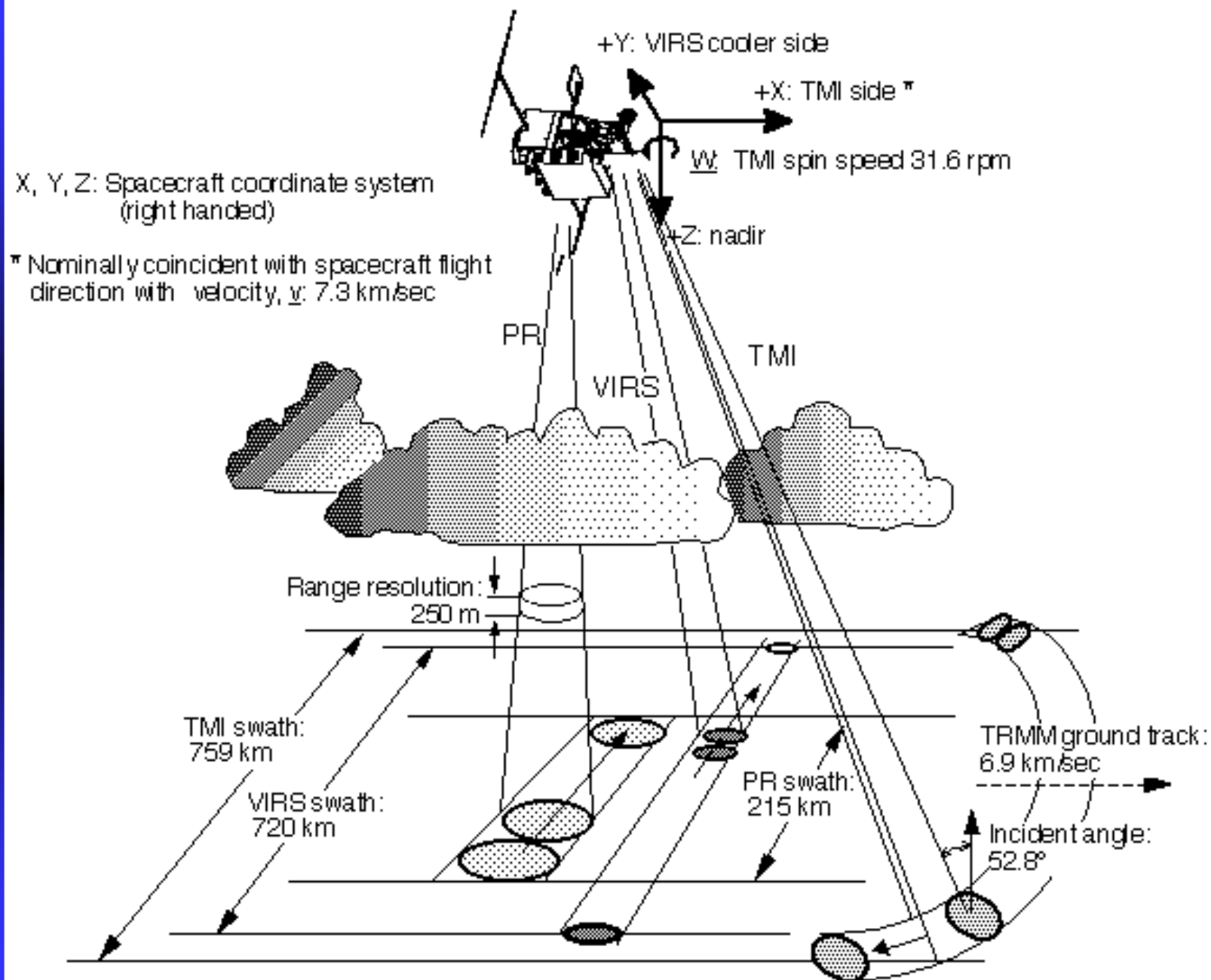
Outline

- Overview of TRMM data services
- Mirador (Data access made simple)
- TOVAS (Data access without downloading data and software)
- Other tools and examples (YOTC, HDAT, Giovanni)
- Other data services (OPeNDAP, WMS, etc.)
- Future plans

What is TRMM ?



The Tropical Rainfall Measuring Mission (TRMM) is a joint U.S.-Japan satellite mission to monitor tropical and subtropical (40° S - 40° N) precipitation and to estimate its associated latent heating.



Mirador (Data Access Made Simple)

- An earth science data search tool developed at the GES DISC
- Simplified, clean interface
- Google mini appliance for metadata keyword searches.
- Spatial and parameter subsetting, format conversion
- Gazetteer (geographic search by feature name capability)

Mirador

+ GES DISC Home

Mirador

+ OVERVIEW

+ HELP CENTER

+ DATA HOLDINGS

+ VIEW CART

Additional Features

+ News

+ Restricted Data

+ Feedback

+ FAQ

Mirador

Data Access Made Simple

You are here: [Keyword Search](#)

Keyword

Projects

Science Areas

Keyword:

Location:

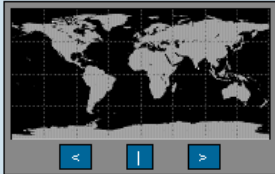
Time Span

From:

To:

Search GES-DISC

Advanced Search ▾



Available: [AIRS, OMI, MLS, HIRDLS, TOMS, UARS, TRMM, GLDAS, SORCE, Subsets from A-Train Sensors \(e.g MODIS, AIRS, OMI and MLS\), MERRA, GOCART, LIMS, MSU, NEESPI, NLDAS, SSBUY, TOVS](#)

What's New: [Quality Screening for AIRS Level 2 Products; TRMM 3B42 available with netCDF conversion and compression](#)

Acknowledgements:
Location Gazetteer data from: [National GeoSpatial Information Agency](#)
Events Gazetteer data from: [Unisys](#), [EPA](#) and [Smithsonian Global Volcanism Program](#)


LATEST NEWS

2011-01-14T22:01:17Z - AIRS Near-Real Time Data and the Dry Season in African savanna
AIRS Near-Real Time Data shows dust and smoke in African savanna
[+ Read More](#)

2011-01-14T20:16:58Z - Caspian Sea temperatures set in motion, set to music
Russian scientist creates simulation of daily sea surface temperatures in the Caspian Sea
[+ Read More](#)

2011-01-07T16:47:28Z - GES DISC provides rapid analysis of factors contributing to record Australian floods
Rainfall and temperature data and anomalies demonstrate dramatic departures from normal conditions
[+ Read More](#)

2011-01-04T15:26:10Z - Solar Radiation and Climate Experiment (SORCE) Collection 11 released
Total Solar Irradiance (TSI) data update is now available at the GES DISC
[+ Read More](#)



An example:

Mirador

Data Access Made Simple

You are here: [Keyword Search](#)

[Keyword](#)[Projects](#)[Science Areas](#)

Keyword:

Location:

Time Span

From:

To:

[Search GES-DISC](#)

[Advanced Search](#) ▾



Available: [AIRS](#), [OMI](#), [MLS](#), [HIRDLs](#), [TOMS](#), [UARS](#), [TRMM](#), [GLDAS](#), [SORCE](#), [Subsets from A-Train Sensors \(e.g MODIS, AIRS, OMI and MLS\)](#), [MERRA](#), [GOCART](#), [LIMS](#), [MSU](#), [NEESPI](#), [NLDAS](#), [SSBUV](#), [TOVS](#)

What's New: [Quality Screening for AIRS Level 2 Products](#); [TRMM 3B42 available with netCDF conversion and compression](#)

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[+ Read More](#)

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Russian scientist creates simulation of daily sea surface temperatures in the Caspian Sea
[+ Read More](#)



7

Mirador

Data Access Made Simple

You are here: [KeywordSearch](#) » [Data sets from daily rainfall search](#)

Keyword

Projects

Science Areas

Data Sets

Results 1 - 10 of 10 for **daily rainfall** (2 seconds)

-More Services (e.g. http download, format conversion, subsets etc) are available for the data set(s). Whenever you add files to the shopping cart, you will be presented with options for selecting a service and service parameters for any data set which has these services.

☐ **Daily TRMM and Others Rainfall Estimate (3B42 V6 derived) (TRMM_3B42_daily)**

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 1097 files found (Avg Size: 2.197 MB)

Parameters: PRECIPITATION RATE

Spatial Resolution: 0.25 degree x 0.25 degree

Temporal Resolution: 1 Day(s)

☐ **TRMM and Other Sources Rainfall Product (TRMM Product 3B43) (TRMM_3B43)**

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 36 files found (Avg Size: 4.415 MB)

Parameters: PRECIPITATION RATE

Spatial Resolution: 0.25 degree x 0.25 degree

Temporal Resolution: 30 Day(s)

☐ **Half-Hourly Radar Site 3-D Reflectivity (TRMM_2A55UW)**

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 13824 files found (Avg Size: 0.441 MB)

Parameters: PRECIPITATION AMOUNT, PRECIPITATION ANOMALIES, PRECIPITATION RATE

Spatial Resolution: 4 km x 4 km

Temporal Resolution: 1 Hour(s)

☐ **2A53: Half-Hourly 2 km Radar Site Rain Map (TRMM_2A53_CSI)**

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 220 files found (Avg Size: 0.007 MB)

Parameters: PRECIPITATION AMOUNT, PRECIPITATION ANOMALIES, PRECIPITATION RATE

Spatial Resolution: 4 km x 4 km

Temporal Resolution: 1 Hour(s)

Keyword Projects Science Areas

Results 1 - 15 for **daily rainfall (3 seconds)**

Sort by time: Descending

Daily TRMM and Others Rainfall Estimate (3B42 V6 derived) [info](#)

The following services are available for the data set(s). Whenever you add files to the shopping cart, you will be presented with options for selecting these services.

[Download via HTTP](#)
[Convert to NetCDF](#)
[Convert to gzipped NetCDF](#)

Add Selected Files To Cart
Add All Files in All Pages To Cart

<input checked="" type="checkbox"/> Select All in Page	Start Time
<input checked="" type="checkbox"/> 3B42_daily.2001.01.01.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-31 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.31.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-30 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.30.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-29 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.29.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-28 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.28.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-27 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.27.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-26 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.26.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-25 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.25.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-24 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.24.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-23 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.23.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-22 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.22.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-21 22:30:00 Metadata
<input checked="" type="checkbox"/> 3B42_daily.2000.12.21.6.bin (2.20 MB) One Click Download: BIN (FTP) BIN (HTTP) NetCDF OPeNDAP	2000-12-20 22:30:00 Metadata

Advanced search:

Mirador
Data Access Made Simple

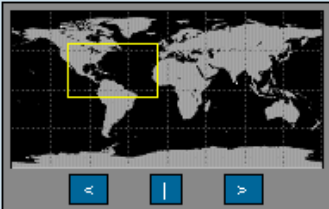
You are here: [Keyword Search](#)

[Keyword](#) [Projects](#) [Science Areas](#)

Keyword:

Location:

Time Span
From:
To:



Event:

Event Type
Storms (1810):
Volcanoes (234):
[Basic Search](#)

Ozone (50646):
Aerosols (36798):

Available: [AIRS, OMI, MLS, HIRDLS, TOMS, MERRA, GOCART, LIMS, MSU, N](#)

What's New: [Quality Screening for AIRS Level](#)

Acknowledgements:
[Location Gazetteer data from](#)
[Events Gazetteer data from:](#)


LATEST NEWS
2011-01-14T22:01:17Z - AIRS Near-Real Time Data and the Dry Season in African savanna
AIRS Near-Real Time Data shows dust and smoke in African savanna
[+ Read More](#)

[from A-Train Sensors \(e.g MODIS, AIRS, OMI and MLS\).](#)

[etCDF conversion and compression](#)

[Information Agency](#)

[Smithsonian Global Volcanism Program](#)



Data Sets

Results 1 - 10 of 52 for TRMM (13 seconds)

For event, did you mean ...

[KATRINA tropical depression](#)

[KATRINA tropical storm](#)


[KATRINA hurricane category 1](#)

[KATRINA hurricane category 2](#)

[KATRINA hurricane category 3](#)

[KATRINA hurricane category 4](#)

[KATRINA hurricane category 5](#)

 -More Services (e.g. http download, format conversion, subsets etc) are available for the data set(s). Whenever you add files to the shopping cart, you will be presented with options for selecting a service and service parameters for any data set which has these services.

☐ TRMM and Other Sources Rainfall Product (TRMM Product 3B43) (TRMM_3B43) 

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 1 files found (Avg Size: 4.415 MB)

Parameters: PRECIPITATION RATE

Spatial Resolution: 0.25 degree x 0.25 degree

Temporal Resolution: 30 Day(s)

☐ Daily TRMM and Others Rainfall Estimate (3B42 V6 derived) (TRMM_3B42_daily) 

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 11 files found (Avg Size: 2.197 MB)

Parameters: PRECIPITATION RATE

Spatial Resolution: 0.25 degree x 0.25 degree

Temporal Resolution: 1 Day(s)

☐ TRMM 3-Hourly 0.25 deg. TRMM and Other-GPI Calibration Rainfall Data (TRMM_3B42) 

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 185 files found (Avg Size: 0.312 MB)

Parameters: PRECIPITATION RATE

Spatial Resolution: 0.25 degree x 0.25 degree

Temporal Resolution: 3 Hour(s)

☐ TRMM Precipitation Radar (PR) Gridded Surface Rain Total Product (TRMM Product 3A26) (TRMM_3A26) 

[View Files](#) | [Info](#) | [Data Calendar](#)

Approx. 1 files found (Avg Size: 5.502 MB)

Parameters: PRECIPITATION RATE

Spatial Resolution: 5 degrees x 5 degrees

Temporal Resolution: 31 Day(s)

☐ TRMM Ground Validation (GV) Calibrated Radar Reflectivity Product (TRMM GV Product 1C51) (TRMM_1C51)

[View Files](#) | [Info](#)

Overview of TOVAS

What is TOVAS?

TOVAS stands for the **TRMM Online Visualization and Analysis System**. The NASA GES DISC is home of TRMM data archive. To facilitate data access, we have developed TOVAS.

What can TOVAS do?

TOVAS allow an easy access to many popular TRMM Level-3 gridded precipitation products, near-real-time products and other precipitation products without **downloading data and software.**

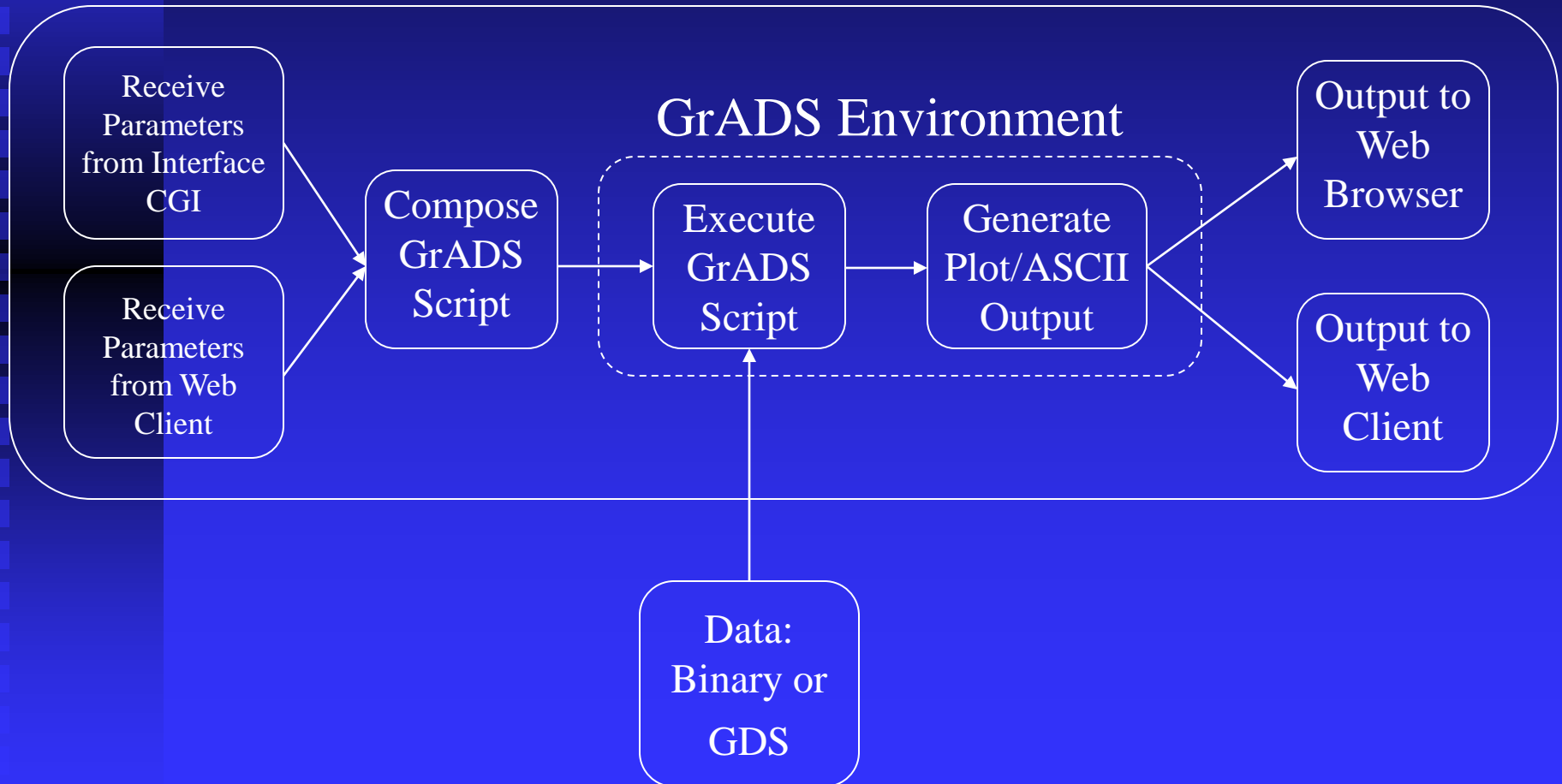
An easy access:

- Generate customized maps, plots, animation, etc.
- Obtain customized data (maps, time series, Hovmoller diagram)
- Format conversion (NetCDF, binary, ASCII)

- Reliable
- Flexible
- Low-cost

TOVAS System Description

Visualization and Analysis Server



TRMM and Other Precipitation Products in TOVAS:

- Near-real-time 3-hourly
- Daily
- Monthly
- Climatology and anomaly
- Willmott Climate Data (monthly, land only)
- Global Precipitation Climatology Centre (monthly, land only)

Services/functions:

- Lat-lon map
- Time series
- Hovmoller diagram
- Scatter plot
- Animation
- Difference/overlay (map and time series)

Services/functions (cont.):

- Anomaly and percent of normal
- Outputs (ASCII, NetCDF, HDF, binary, etc.)
- KMZ (Google Earth)

TOVAS Landing Page:

TRMM Online Visualization and Analysis System (TOVAS)

TOVAS New Release (2008/09/12)

Giovanni TOVAS is in transition to a new web host. Two new transitioned instances of TOVAS have been released:

- [Experimental Real-Time TRMM Multi-Satellite Precipitation Analysis \(TMPA-RT\)](#)
- [TMPA-RT Intermediate IR Product](#)
- [TMPA-RT Intermediate Microwave Product](#)
- [3-hourly product \(3B42 V6\)](#)
- [Daily TRMM and Other Rainfall Estimate \(3B42 V6 derived\)](#)
- [Monthly products \(3B43 V6, 3A12 V6, and 3A25 V6\)](#)
- [Monthly Willmott and Matsuura Global Precipitation \(1950 - 1999\)](#)

Several new functions and parameters have been added along with additional data download formats (HDF, NetCDF and KMZ).

As planned, all current TOVAS instances, listed below in this page, will be similarly converted to the [new system](#).

Welcome to TOVAS, a member of the [Giovanni](#) (GES-DISC DAAC On-line Visualization and Analysis System) family, which provides users with an easy-to-use, Web-based interface for the visualization and analysis of Earth Science data.

Note: The Java Version uses Java applet for interactively selecting an area of interest. If you have difficulties in using the Java Version, please try the Non Java Version.

Near-Real-Time Monitoring Product (For research, use Archive Data.)

Experimental Real-Time TRMM Multi-Satellite Precipitation Analysis (TMPA-RT): 3B42RT	JAVA Version	Non JAVA Version
Daily Global and Regional Rainfall (TMPA-RT 3B42RT derived)	JAVA Version	Non JAVA Version
TMPA-RT Intermediate IR Product: 3B41RT (VAR)	JAVA Version	Non JAVA Version
TMPA-RT Intermediate Microwave Product: 3B40RT (HQ)	JAVA Version	Non JAVA Version

Rainfall Archives

Monthly Global Precipitation (GPCP)	JAVA Version	Non JAVA Version
Prototype Interactive Intercomparison of Rainfall Products	JAVA Version	Non JAVA Version
3-hourly TRMM and Other Rainfall Estimate (3B42 V6)	JAVA Version	Non JAVA Version
Daily TRMM and Other Rainfall Estimate (3B42 V6 derived)	JAVA Version	Non JAVA Version

Near-Real-Time Monitoring Product (For research, use Archive Data.)

Experimental Real-Time TRMM Multi-Satellite Precipitation Analysis (TMPA-RT): 3B42RT	JAVA Version	Non JAVA Version
Daily Global and Regional Rainfall (TMPA-RT 3B42RT derived)	JAVA Version	Non JAVA Version
TMPA-RT Intermediate IR Product: 3B41RT (VAR)	JAVA Version	Non JAVA Version
TMPA-RT Intermediate Microwave Product: 3B40RT (HQ)	JAVA Version	Non JAVA Version

Rainfall Archives

Monthly Global Precipitation (GPCP)	JAVA Version	Non JAVA Version
Prototype Interactive Intercomparison of Rainfall Products	JAVA Version	Non JAVA Version
3-hourly TRMM and Other Rainfall Estimate (3B42 V6)	JAVA Version	Non JAVA Version
Daily TRMM and Other Rainfall Estimate (3B42 V6 derived)	JAVA Version	Non JAVA Version
Monthly TRMM and Other Data Sources Rainfall Estimate (3B43 V6)	JAVA Version	Non JAVA Version
Monthly Rainfall (3B43 V6) Anomaly	JAVA Version	Non JAVA Version
Inter-Comparison of Rainfall Climatology	JAVA Version	Non JAVA Version
Monthly TMI rain, latent heat, cloud liquid water profiles (3A12 V6)	JAVA Version	Non JAVA Version
Monthly Rainfall (3A25 V6)	JAVA Version	Non JAVA Version

Ground Observation Archives

Monthly Willmott and Matsuura Global Precipitation (1950 - 1999)	JAVA Version	Non JAVA Version
Monthly GPCC Rainfall (1986 - Present, Monitoring Product)	JAVA Version	Non JAVA Version

TOVAS Interface:

Near-Real-Time Monitoring Product (For research, use Archive Data.)

Experimental Real-Time TRMM Multi-Satellite Precipitation Analysis (TMPA-RT): 3B42RT

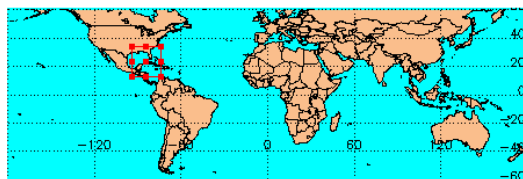
This interface is designed for visualization and analysis of the Experimental Real-Time TRMM Multi-Satellite Precipitation Analysis (TMPA-RT): 3B42RT.

Users can generate plots or ASCII Output for area average (Lat-Lon Map), time series (Time Series), and Hovmoller diagram. The animation is available for Lat-Lon Maps. Selecting [here](#) or the **Help** buttons will open a new window with detailed help. [More details about the data are also available.](#)

Help

Alert: A new window may be opened when a link or a button is selected below.

Click and drag to select area; or input latitudes (-60, 60) and longitudes (-180 ~ 180) or [Click for non Java/JavaScript version](#)
[More information on supported browsers and platforms](#)



North latitude
33.0 N

West East
94.0 W 74.0 W

South latitude
12.0 N

Zoom In Zoom Out

3-hourly TMPA-RT
Accumulated Rainfall (mm)
Rain Rate (mm/hr)

Plot Type: Lat-Lon Map

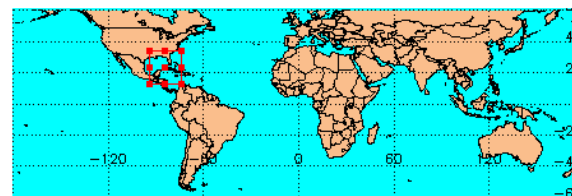
Begin Date: yr 2011 mo January dy 13 hr 09Z (Data Begin: 2008/10/01 00Z)

End Date: yr 2011 mo January dy 13 hr 09Z (Data End: 2011/01/13 09Z)

[Please check TMPA-RT Data Outages page](#)

Color Options:
☐ Pre-defined
☒ Dynamic
☐ Customized (linear only): Min Max

Click and drag to select area; or input latitudes (-60, 60) and longitudes (-180 ~ 180) or [Click for non Java/JavaScript version](#)
[More information on supported browsers and platforms](#)



North latitude
33.0 N

West East
94.0 W 74.0 W

South latitude
12.0 N

Zoom In Zoom Out

3-hourly TMPA-RT
Accumulated Rainfall (mm)
Rain Rate (mm/hr)

Plot Type: Lat-Lon Map

Begin Date: yr 2011 mo January dy 13 hr 09Z (Data Begin: 2008/10/01 00Z)

End Date: yr 2011 mo January dy 13 hr 09Z (Data End: 2011/01/13 09Z)

[Please check TMPA-RT Data Outages page](#)

Color Options:
☐ Pre-defined
☒ Dynamic
☐ Customized (linear only): Min Max

Time Series Plot
Y-Axis Options:
☒ Dynamic
☐ Customized: Min Max Interval

ASCII Output Resolution
(°): 0.25x0.25

Generate Plot ASCII Output Reset Form

Help

TOVAS Interface (cont.):

TRMM Online Visualization and Analysis System (TOVAS)
TRMM Level-3 Monthly Products.

[Home](#) [Remove All](#)

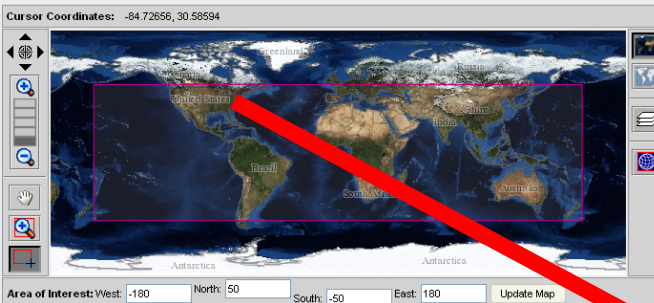
This web based tool is designed for visualization and analysis of the TRMM Level-3 data products. Users can generate plots for Lat-Lon Map, Time Series, Hovmöller diagram and more. Animation is available for Lat-Lon Maps. Results can be downloaded in HDF, NetCDF, ASCII, and Google Earth KMZ formats.

Note: The latent heating products of TRMM 2A12 and 3A12 over ocean surfaces should be regarded as experimental. Please confer first with the algorithm developers (by contacting the GES DISC) when using the latent heating product over ocean. Over-land latent heating estimates from TRMM products 2A12 and 3A12 should not be used, as they have not been evaluated quantitatively or qualitatively.

Select:

Spatial

Cursor Coordinates: -84.72656, 30.58594



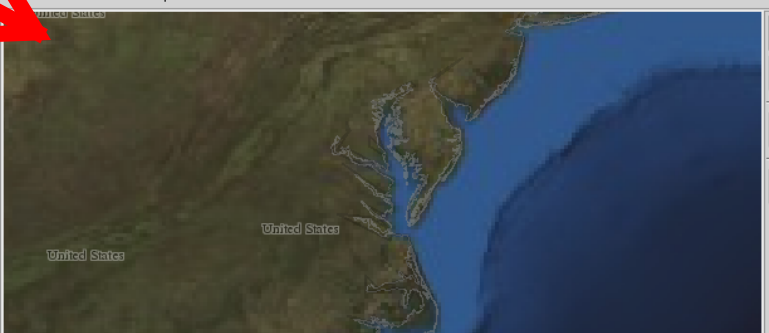
Area of Interest: West: -180 North: 50 South: -50 East: 180 [Update Map](#)

Vertical Profile

Select a vertical profile range. The range selection is disabled unless a qualifying parameter is selected. In order to enable this option (and populate the list of values), select a 3D parameter. 3D parameters have at least three dimensions and are labeled with a '3D' in the 'Parameters' section.

NOTE: Selected 3D parameters **must** have the same **vertical** (i.e., 3rd dimension) units in order to enable the vertical level menu.

Cursor Coordinates: -69.94860, 38.11384



Area of Interest: West: -180 North: 50 South: -50 East: 180 [Update Map](#)

TOVAS Interface (Cont.):

TRMM Online Visualization and Analysis System (TOVAS)

TRMM Level-3 Monthly Products.

[Home](#) [Results #1](#) [Remove All](#)

[Visualization Results](#) [Download Data](#) [Product Lineage](#) [Acknowledgment Policy](#)

Download source data products and data products derived from Giovanni processing stages. For simplicity purposes, only the initial retrieval and final rendering phases are currently accessible for downloading. Supported download formats are HDF, NetCDF(NCD), ASCII, and KMZ (ASCII is available only when the array size is within about half-million points). To **download multiple files** at once, select the desired files (from any section) by clicking on their associated checkboxes, and then click **'Download in Batch'**. **Note:** that 'n/a' means that a file size or other column value is not available; 'saa' means that a file is exactly the same as the previous one in the list. Also, not all services and data products support all download file formats.

Initial Data Retrieval

Data Product	Start Time	File Size (b)	Download Files
TRMM_3B43.006 (precipitation)	2010-12-01T00:00:00Z	3964341	<input type="checkbox"/> <input type="checkbox"/>

[Download in Batch](#)

Two Dimensional Map Plot

Input Files	Start Time	File Size (b)	Download Files
TRMM_3B43.006 (precipitation)	2010-12-01T00:00:00Z	1909065	<input type="checkbox"/> <input type="checkbox"/>

[Download in Batch](#)

Output Files

precipitation.TRMM_3B43.006.AreaMap.2010-12.gif	22589	<input type="checkbox"/>
---	-------	--------------------------

KMZ

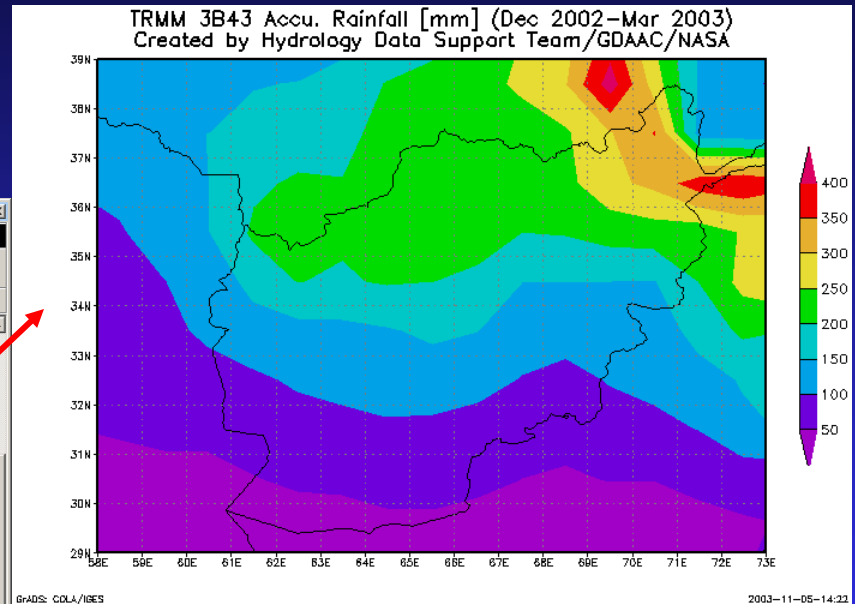
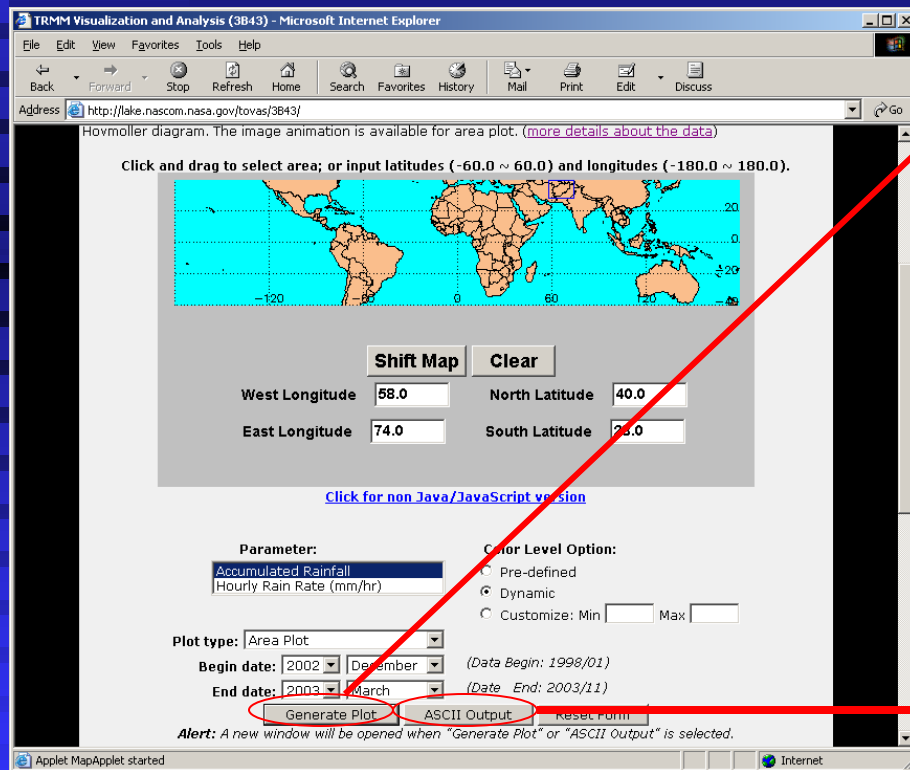
6/13/2011

TRMM Data Service Update

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Examples of TOVAS

TOVAS Functions – Area Plot



NetScape

TRMM 3B43 Monthly Precip. Product

Selected parameter: Accumulated Rainfall

Selected area: lat=[29.0,39.0], lon=[58.0,73.0]

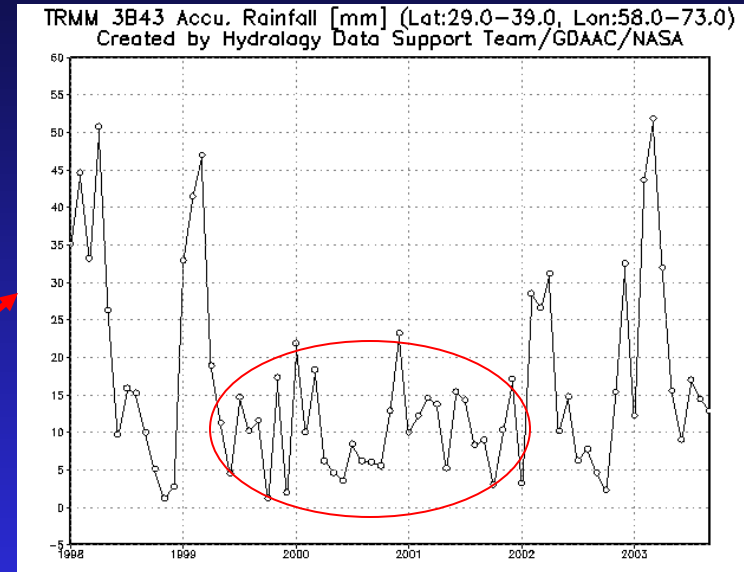
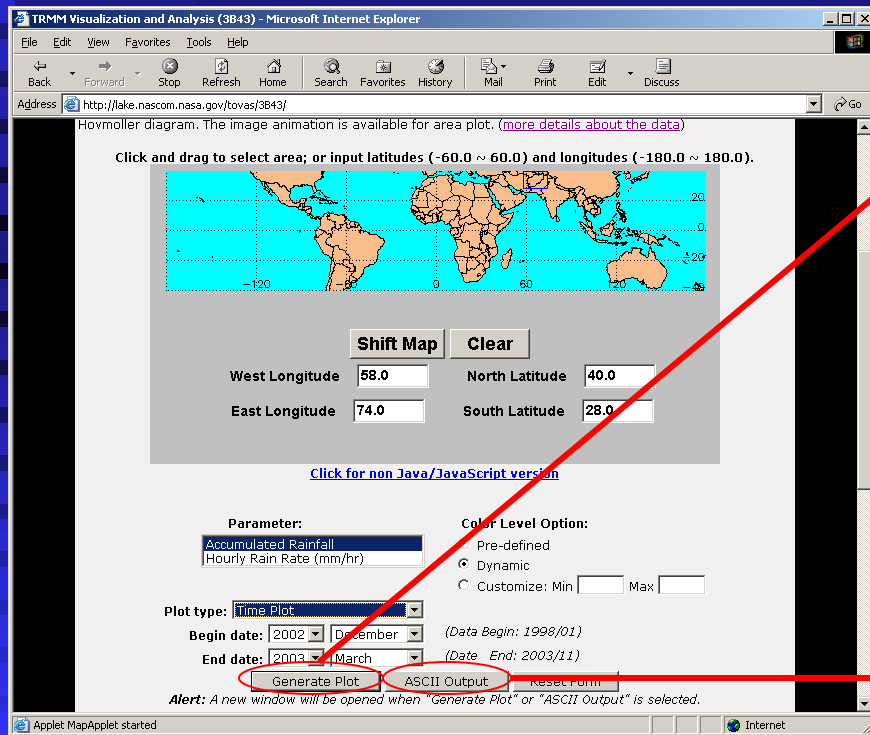
Selected time period: (December 2002–March 2003)

Undefined/Missing Values: -9999.9

Latitude	Longitude	Precipitation(mm)
29.00	58.00	35.3560
29.00	59.00	37.1569
29.00	60.00	26.8200
29.00	61.00	30.3092
29.00	62.00	30.4134
29.00	63.00	34.4047
29.00	64.00	45.4186
29.00	65.00	41.1013
29.00	66.00	32.1101
29.00	67.00	25.7904
29.00	68.00	22.9502
29.00	69.00	23.9566
29.00	70.00	26.1316
29.00	71.00	33.8844
29.00	72.00	42.4837
29.00	73.00	49.4474
30.00	58.00	38.7708
30.00	59.00	42.7285
30.00	60.00	42.5762
30.00	61.00	47.9457
30.00	62.00	56.2960
30.00	63.00	57.1792
30.00	64.00	56.7420
30.00	65.00	63.4520
30.00	66.00	60.9705
30.00	67.00	49.6300

Document: Done

TOVAS Functions (cont.) – Time Plot

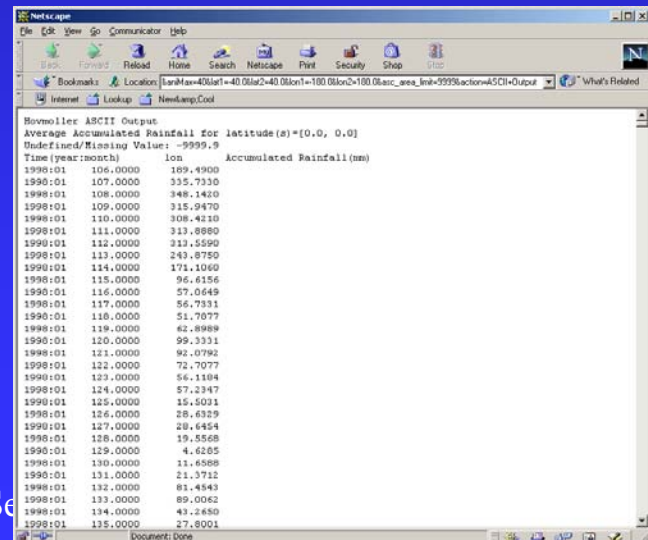
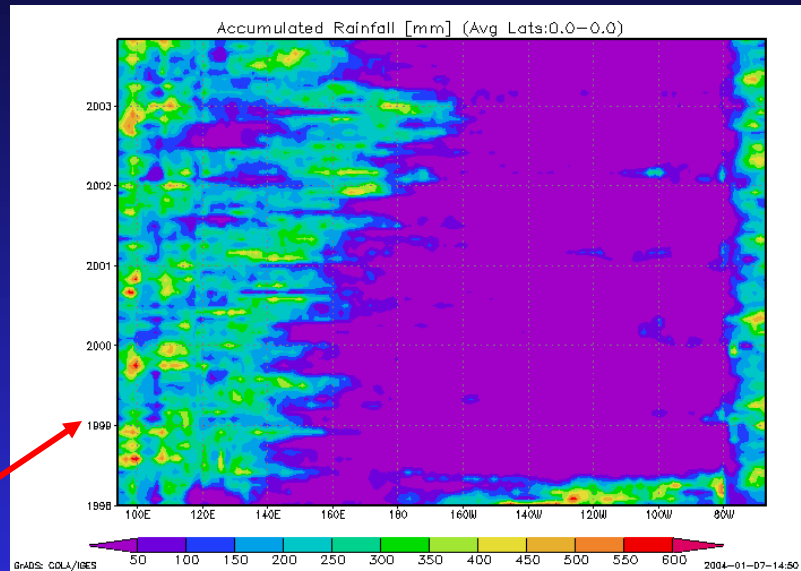
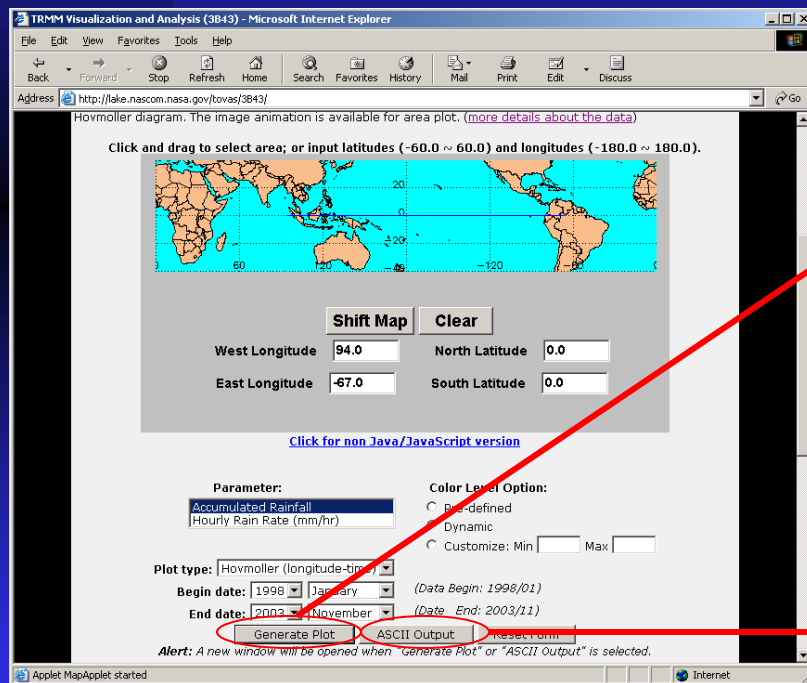


NetScape

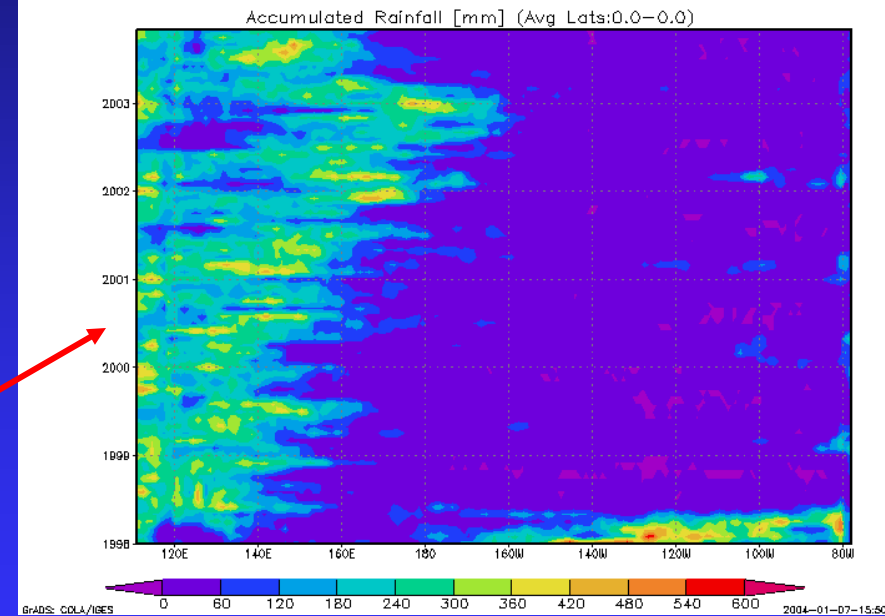
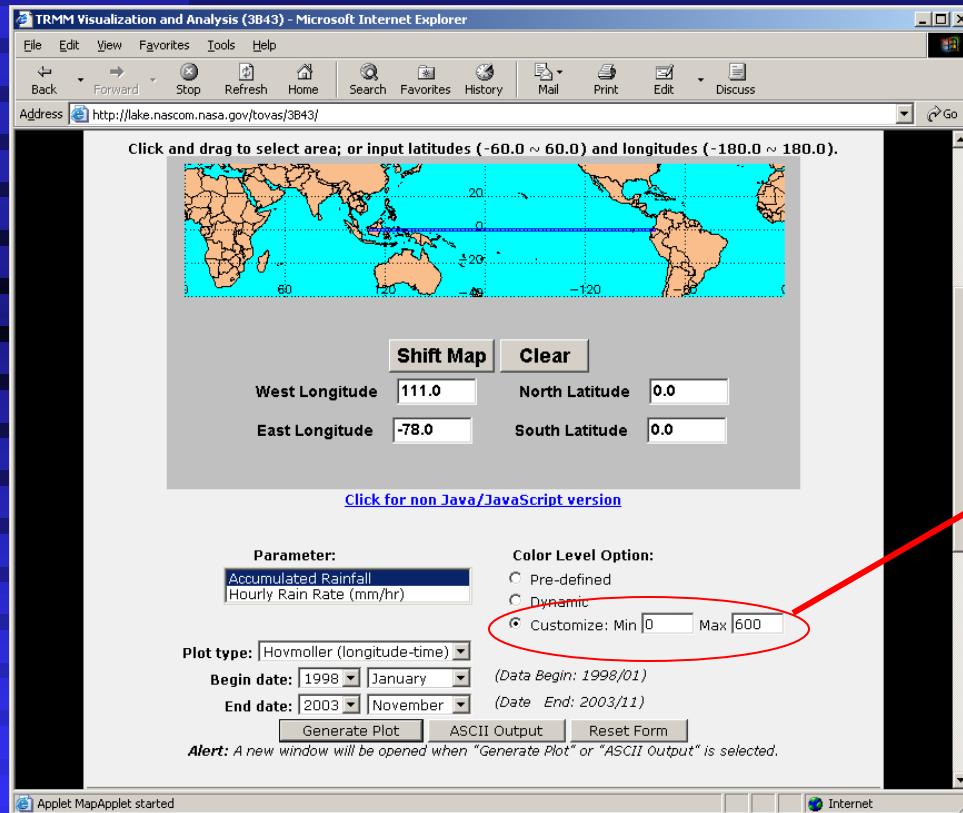
TRMM 3B43 Monthly Precip. Product
Average Precip. for lat=(29.0,39.0), lon=(58.0,73.0)
Undefined/Missing Value: -9999.9

Time (year:month)	Precipitation (mm)
1998:12	2.6137
1999:01	32.9826
1999:02	41.4947
1999:03	47.0012
1999:04	10.9611
1999:05	11.2917
1999:06	4.5855
1999:07	14.7212
1999:08	10.2717
1999:09	11.6261
1999:10	1.2497
1999:11	17.3697
1999:12	2.0496
2000:01	21.9309
2000:02	10.0802
2000:03	18.3520
2000:04	6.2094
2000:05	4.6254
2000:06	3.5593
2000:07	8.4970
2000:08	6.1997
2000:09	6.0385
2000:10	3.5626
2000:11	12.9275
2000:12	23.2437
2001:01	10.0040
2001:02	12.2163
2001:03	14.6449
2001:04	11.7684

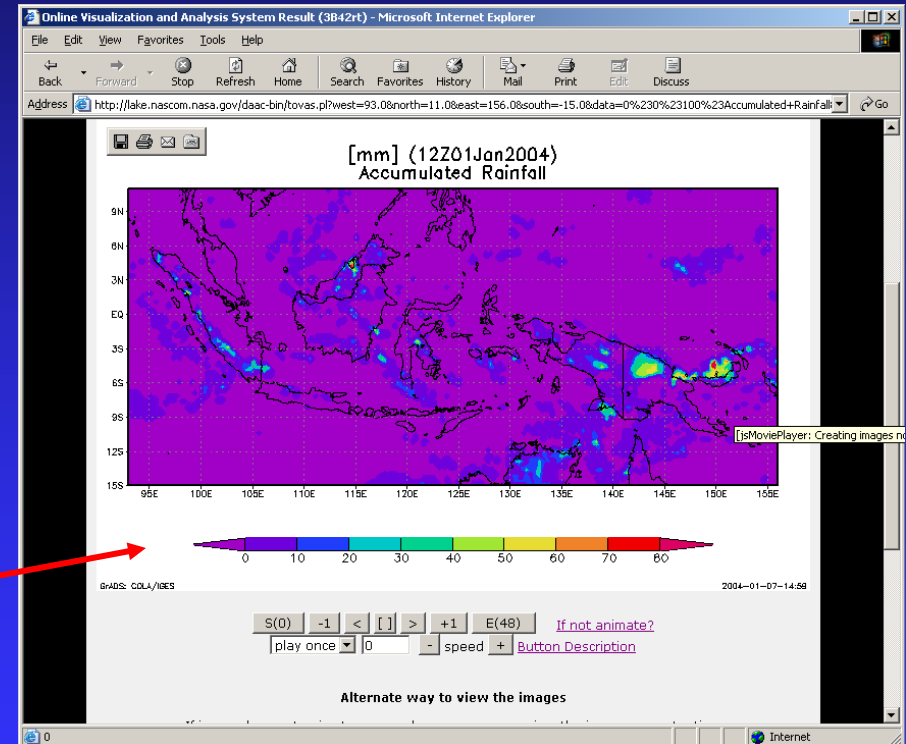
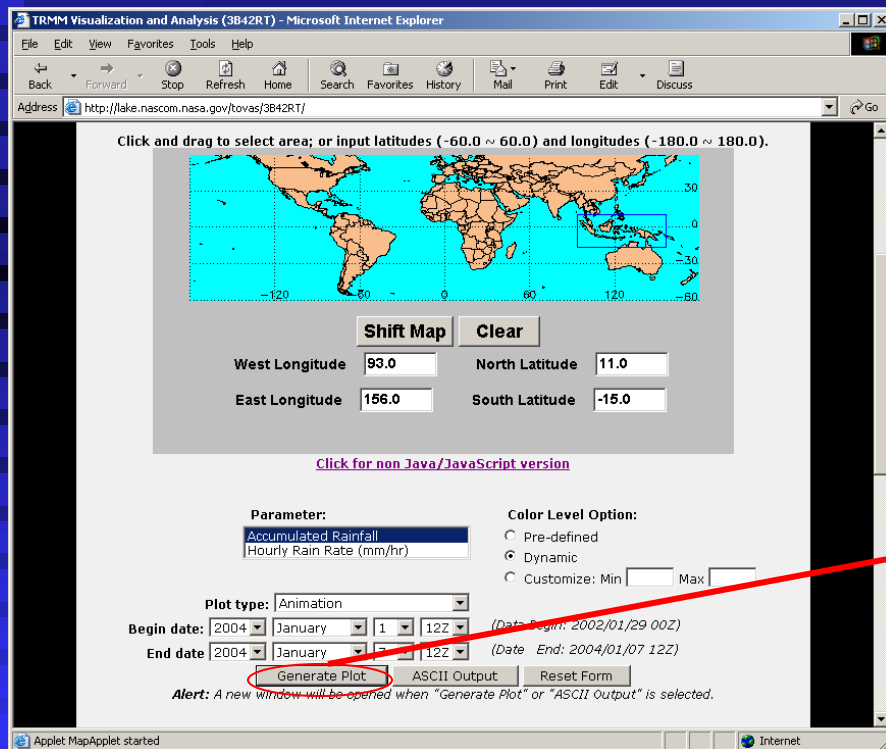
TOVAS Functions (cont.) – Hovmoller



TOVAS Functions (cont.) – Custom Plot



TOVAS Functions (cont.) – Animation



Other tools and examples (YOTC, HDAT, Giovanni)

YOTC (Year of Tropical Convection)

- YOTC-GS L3 is a web-based graphics and analysis tool to explore Level 3 data products.
- YOTC-GS L2 is a web-based graphics and analysis tool to explore Level 2 data products.

YOTC Examples: YOTC-GS L3

Atmosphere

☐ Clouds(2000/02/24 - 2011/01/11)

Parameter	Data Product Info
<input type="checkbox"/> Cirrus Reflectance (QA-w)	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> Cloud Effective Emissivity	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> Cloud Effective Emissivity Day	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> Cloud Effective Emissivity Night	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> Cloud fraction_ascending (CloudFrc_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Cloud fraction_descending (CloudFrc_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11

☐ Temperature(2002/08/31 - 2011/01/11)

Parameter	Data Product Info
<input type="checkbox"/> Surface air temperature_ascending (SurfAirTemp_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Surface air temperature_descending (SurfAirTemp_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Surface skin temperature_ascending (SurfSkinTemp_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Surface skin temperature_descending (SurfSkinTemp_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11

☐ Aerosols(2000/02/24 - 2011/01/12)

Parameter	Data Product Info
<input type="checkbox"/> Absorbing Aerosol Optical Thickness	OMAEROe.003 Aura OMI 2004/10/01 - 2011/01/12
<input type="checkbox"/> Aerosol Optical Depth at 550 nm	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> Aerosol Optical Thickness	OMAEROe.003 Aura OMI 2004/10/01 - 2011/01/12
<input type="checkbox"/> Aerosol R_eff - Ocean (QA-w)	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> Aerosol Single Scattering Albedo	OMAEROe.003 Aura OMI 2004/10/01 - 2011/01/12
<input type="checkbox"/> Aerosol Small Mode Fraction Ocean (QA-w)	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14

☐ Radiative(2002/08/31 - 2011/01/11)

Parameter	Data Product Info
<input type="checkbox"/> Clear-sky outgoing long-wave radiation flux_ascending (ClrOLR_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Clear-sky outgoing long-wave radiation flux_descending (ClrOLR_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> IR surface emissivity_ascending (EmisIR_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> IR surface emissivity_descending (EmisIR_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Microwave surface emissivity_ascending_MW_only (EmisMW_A_MW_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11

☐ Height(2002/08/31 - 2011/01/11)

Parameter	Data Product Info
<input type="checkbox"/> Geopotential height_ascending (GPHeight_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Geopotential height_descending (GPHeight_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Geopotential height (microwave)_ascending_MW_only (GPHeight_MW_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Geopotential height (microwave)_descending_MW_only (GPHeight_MW_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11

☐ Water Vapor(1998/01/01 - 2011/01/11)

Parameter	Data Product Info
<input type="checkbox"/> H2O - 700-300mb (QA-w, IR)	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> H2O - surf.-920mb (QA-w, IR)	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> H2O - Total Column (QA-w, IR)	MOD08_D3.005 MODIS-Terra Ver. 5 2000/02/24 - 2010/04/14
<input type="checkbox"/> precipitation	TRMM_3B42_DAILY.006 TRMM 1998/01/01 - 2009/04/30
<input type="checkbox"/> Total column cloud liquid water_ascending (TotCldLiqH2O_A)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11
<input type="checkbox"/> Total column cloud liquid water_descending (TotCldLiqH2O_D)	AIRX3STD.005 Aqua - AIRS standard 2002/08/31 - 2011/01/11

Ocean

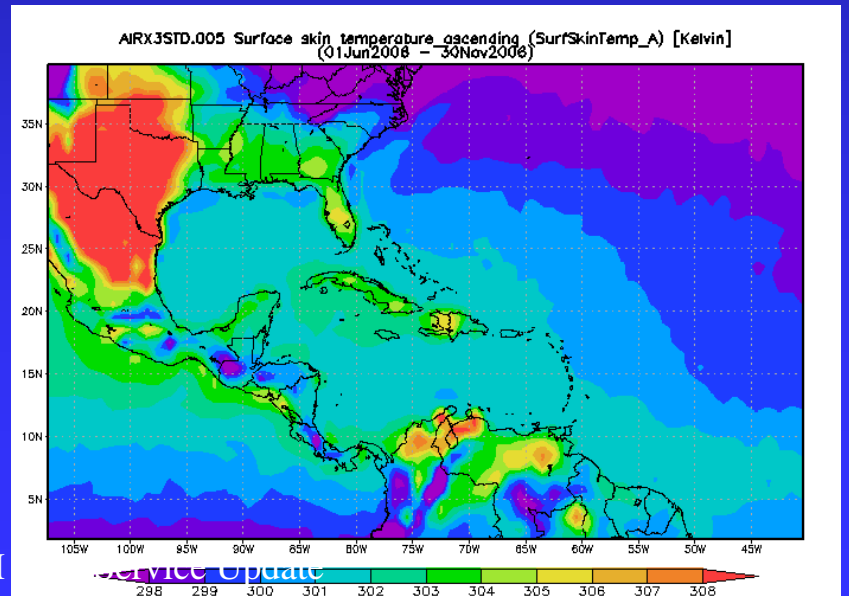
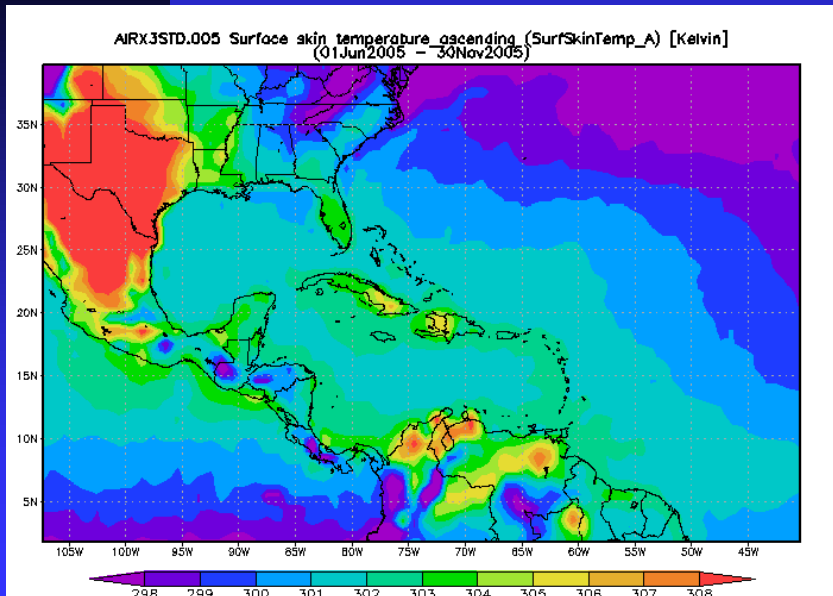
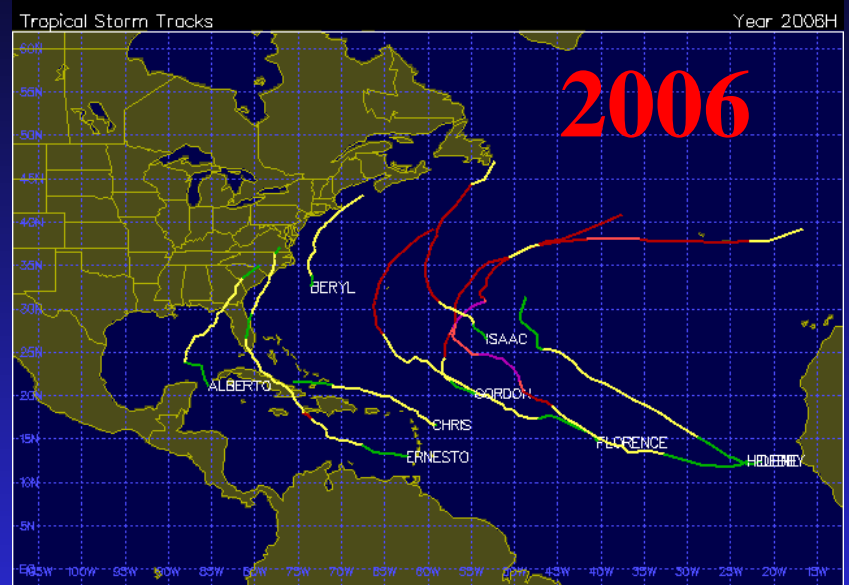
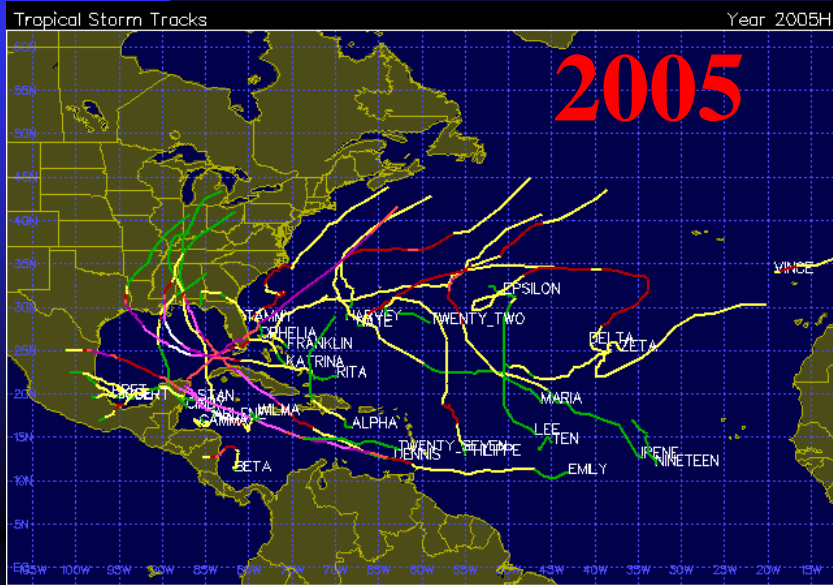
☐ Sea Surface Temperature(2008/05/01 - 2010/04/30)

Parameter	Data Product Info
<input type="checkbox"/> Sea Surface Temperature - LowRes (38 km/10.7 GHz)	AE_DyOcn.002 AMSR-E 2008/05/01 - 2010/04/30
<input type="checkbox"/> Sea Surface Temperature - VeryLowRes (56 km/6.9 GHz)	AE_DyOcn.002 AMSR-E 2008/05/01 - 2010/04/30

☐ Sea Surface Wind(2008/05/01 - 2010/04/30)

Parameter	Data Product Info
<input type="checkbox"/> Sea Surface Wind Speed - LowRes (38 km/10.7 GHz)	AE_DyOcn.002 AMSR-E 2008/05/01 - 2010/04/30
<input type="checkbox"/> Sea Surface Wind Speed - MedRes (21 km/18.9 GHz)	AE_DyOcn.002 AMSR-E 2008/05/01 - 2010/04/30

AIRS Skin Temperature




YOTC Examples: YOTC-GS L2

YOTC

- + OVERVIEW
- + DATA HOLDINGS
- + DOCUMENTATION

Additional Features

- + News
- + Tools
- + Science Focus
- + Applications
- + Links
- + FAQ



YOTC Year Of Tropical Convection

You are here: [GES DISC Home](#) » [YOTC](#) » YOTC - Giovanni System (Beta Version 0.5)

YOTC - Giovanni System (Beta Version 0.5)

The YOTC-Giovanni System provides visualization and data for parameters relevant to the research and investigation of tropical convection. This is a tool that is in progress and will be advancing over time. For more information on how to use this tool please view the [YOTC-GS Guide](#). All known problems and features to come are available in the [Release Notes](#).

- To view Level 3 parameters: [YOTC - Giovanni System Level 3 Interface](#). This interface includes AIRS, MODIS, AMSR-E, TRMM and OMI Level 3 products.
- Access to MLS parameters: [MLS interface](#)

Criteria

Results

To see plots of YOTC data, choose from the criteria below and click Get Plot(s)

Select Service

☒ Profile ☐ Lat-Lon Map

[Select Parameter](#)

*To select a parameter, make a **single** selection from each list below (beginning with the left-most list)*

Instrument	Dataset	Parameter
AIRS-Aqua	AIRS2RET 005	Air Temp (3D)
PR-TRMM		Air Temperature MW Only
TMI-TRMM		GP (MW only) (3D)
		GP at pressure level (3D)
		Saturation Water Vapor MI

☐ Ascending ☒ Descending


Select Pressure

▼ No pressure choices available


Select Search Type

☒ Nearest Profile ☐ Grid Cell

Select Map Resolution

 No resolution choices available

Select Date

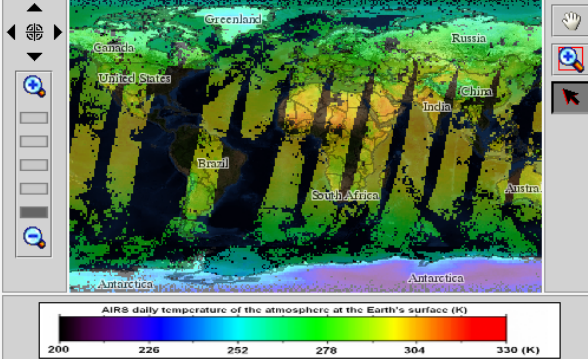
5/15/2008 

Select Location

Longitude: Latitude:

[Guide Map](#) : Daily Temperature of the Atmosphere Descending

Cursor Coordinates: -14.76563, 60.46875

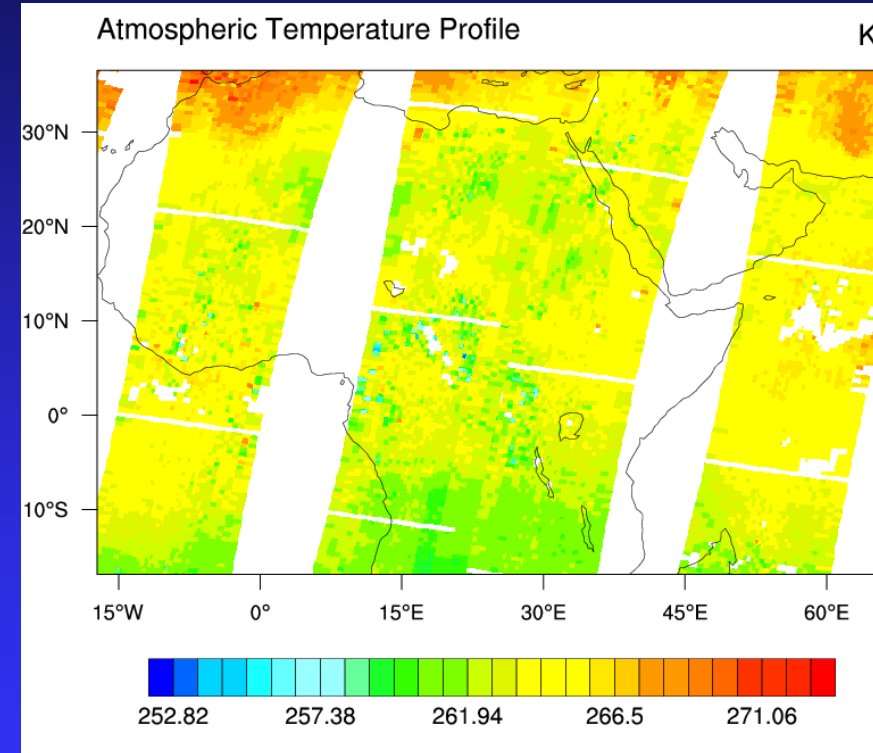
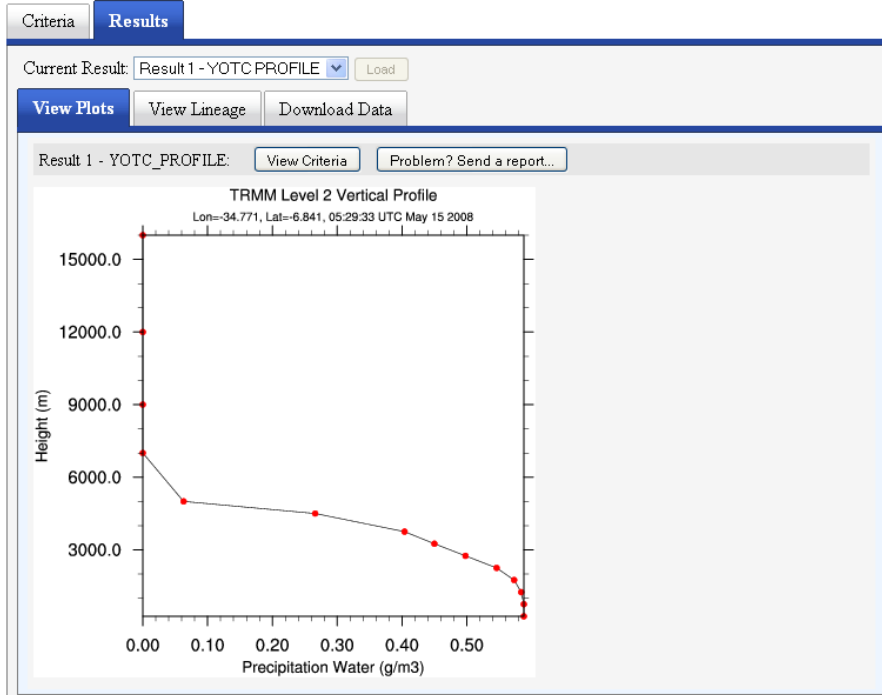


AIRS daily temperature of the atmosphere at the Earth's surface (K)

200 226 252 278 304 330 (K)

To see plots of YOTC data, choose from the criteria above and click

Sample plots:



Hurricane Data Analysis Tool:

Hurricanes

- + OVERVIEW
- + DATA HOLDINGS
- + HURRICANE VIEWER

Additional Features

- + News
- + Image Gallery
- + Science Focus
- + Links

Hurricanes

You are here: [GES DISC Home](#) > [Hurricanes](#) > [Data Holdings](#) > Hurricane Data Analysis Tool

Hurricane Data Analysis Tool

The Hurricane Data Analysis Tool (formerly the TRMM QuikSCat Analysis tool) allows users to overlay various data products relevant in the study of hurricanes in an area plot, a time plot or animation using an interactive tool. The data products being offered include NCEP/CPC 4-km Global (60 deg N- 60 deg S) Merged IR Brightness Temperature Dataset, TRMM's product 3B42, TMI's sea surface temperature, NCEP Reanalysis sea level pressure, QuikSCat's wind and global Merged IR product. This tool is beneficial for users to obtain a visualization of a single product, animation or a comparison of two products during a hurricane event.

Please see the [FAQ](#) for more information.

First Select Data Combination

☐ Satellite Data Only ☐ Satellite and Model Data ☒ Merged IR Data

Dataset

Select base dataset
TRMM 3B42 Daily

Select overlay dataset
QuikSCAT Winds

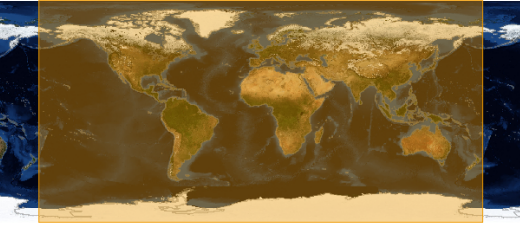
Plot Type

Plot type:
Area Plot

Wind Plot type (Apply to QuikSCAT area plot ONLY):
Vector

Spatial Selection

Cursor Coordinates: 0.00000, 0.00000



Area of Interest: West: -180 North: 90 South: -90 East: 180 [Update Map](#)

Temporal Selection

You may order data from a range of days using the selection boxes below. An excessive range of days may cause processing delays or exceed the amount of data that may be ordered.

- TRMM 3B42 Daily Precipitation: 01/01/1998 - 10/31/2010
- QuikSCAT Ocean Surface Winds: 07/19/1998 - 11/21/2009
- TMI SST: 01/01/1998 - 10/31/2010

Start Yr: 2010 Start Mon: October Start Day: 31

End Yr: 2010 End Mon: October End Day: 31

Color Bar [info](#)

☒ Dynamic

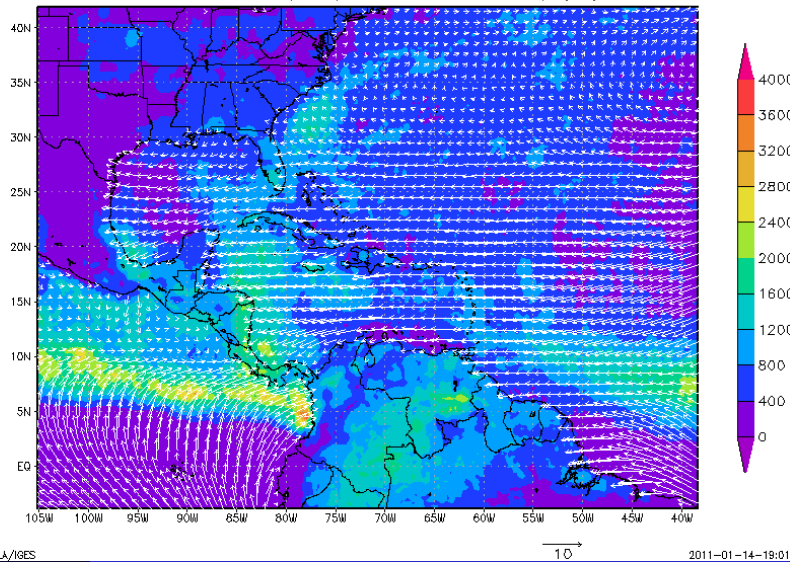
☐ Custom: Min -50 Max 50

[Generate Plot](#) [Reset Form](#)

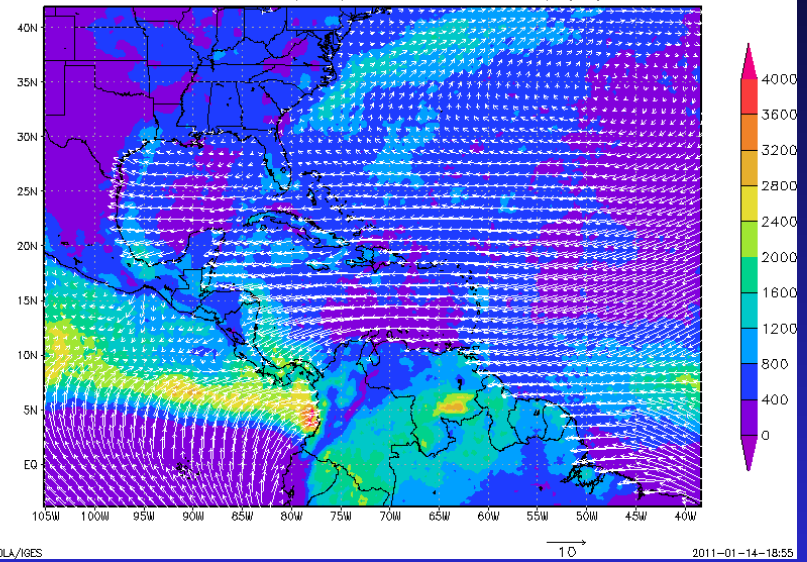
BETA VERSION 4.0:

Samples:

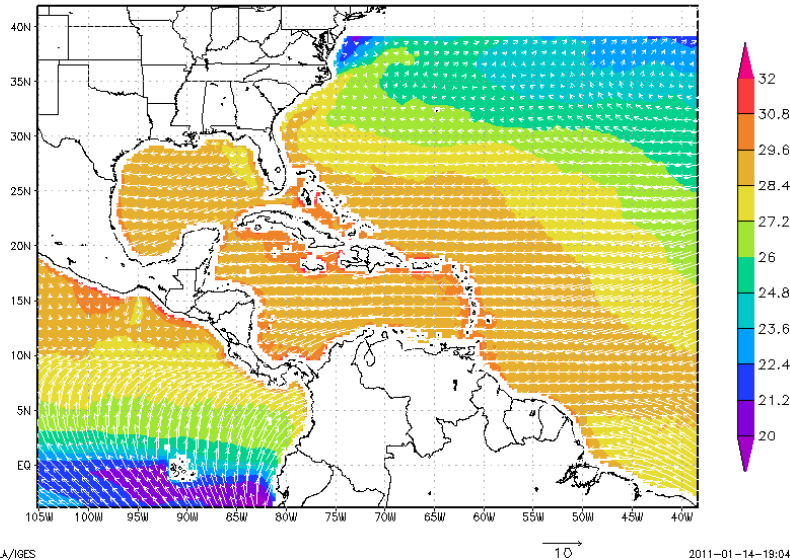
(01 Jun 2005– 30 Nov 2005)
Shaded–3B42(mm) Vector–QuikSCAT(m/s)



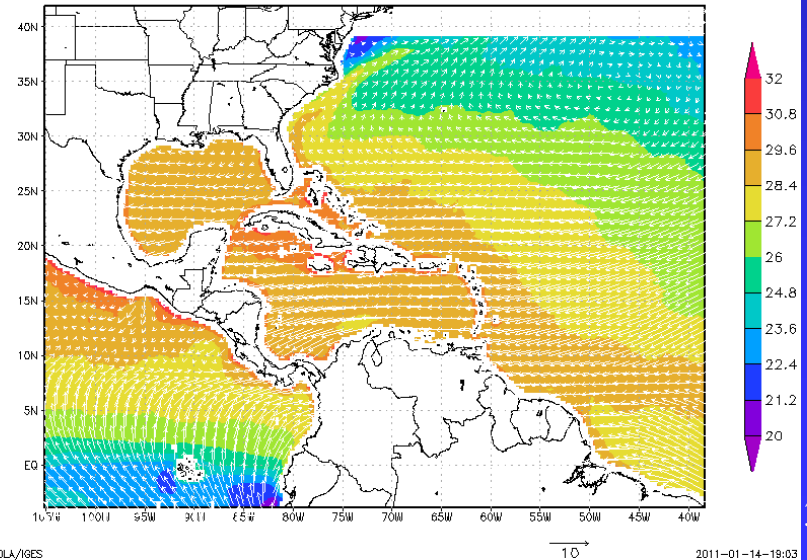
(01 Jun 2006– 30 Nov 2006)
Shaded–3B42(mm) Vector–QuikSCAT(m/s)



(01 Jun 2005– 30 Nov 2005)
Shaded–TMI SST(deg.) Vector–QuikSCAT(m/s)

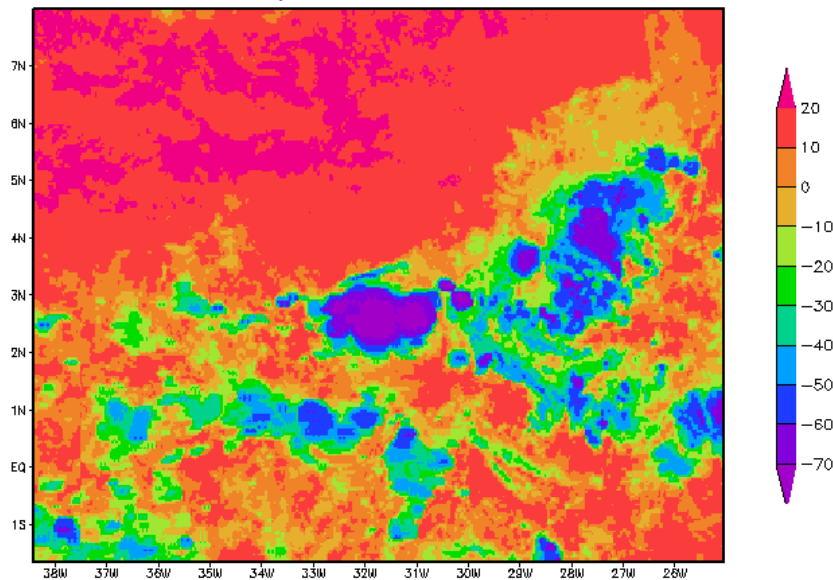


(01 Jun 2006– 30 Nov 2006)
Shaded–TMI SST(deg.) Vector–QuikSCAT(m/s)

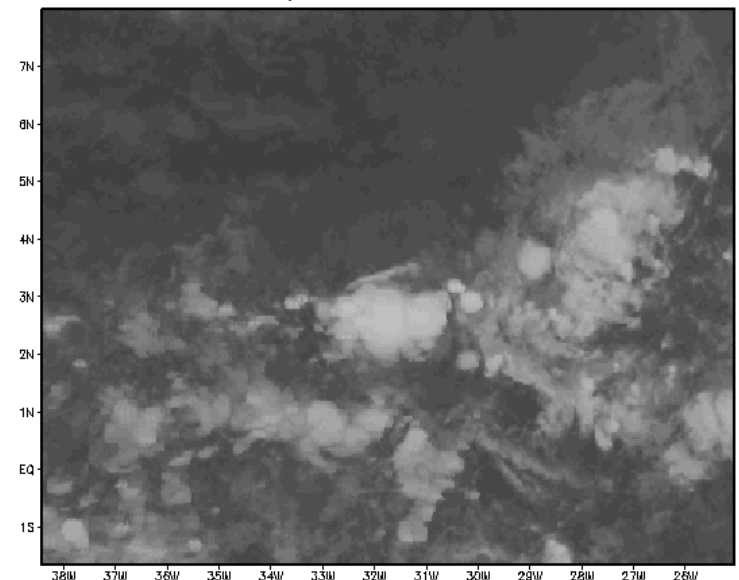


AF Flight-447: Satellite Observation of Mesoscale Convective System Development on 1 June, 2009

Global Merged IR (00min23Z31MAY2009)
Created by NASA Goddard GES DISC

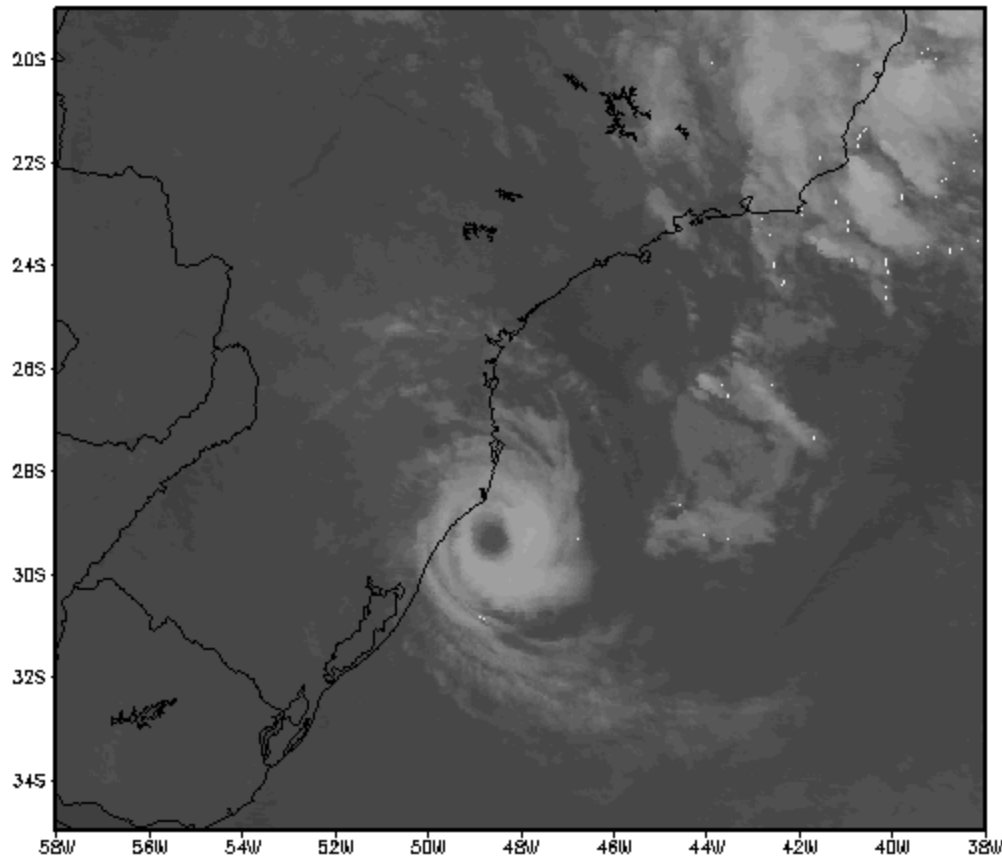


Global Merged IR (00min23Z31MAY2009)
Created by NASA Goddard GES DISC



Examples: Category 2 cyclone Catarina – Landfall

Global Merged IR (00min01Z28MAR2004)
Created by NASA Goddard GES DISC



Giovanni (the GES-DISC (Goddard Earth Sciences Data and Information Services Center) Interactive Online Visualization ANd aNalysis Infrastructure:


Giovanni

» **OVERVIEW**

- + What is Giovanni?
- + Who Uses Giovanni?
- + Giovanni Parameters
- + Giovanni Plot Types
- + How to Use Giovanni
- + How to Acknowledge Giovanni
- + Acknowledgements

Additional Features

- + [News](#)
- + [Users Manual](#)
- + [Publications](#)
- + [Newsletters](#)
- + [Feedback](#)



You are here: [GES DISC Home](#) » Giovanni

GIOVANNI

Giovanni is a Web-based application developed by the GES DISC that provides a simple and intuitive way to visualize, analyze, and access vast amounts of Earth science remote sensing data without having to download the data.

Giovanni is comprised of a number of interfaces, called instances, each tailored to meet the needs of different Earth science research communities. To access a Giovanni instance, click on one of the four categories below.

- **Atmospheric Instances:** A-Train along CloudSat Track; Aerosol Optical Thickness Measurement and Model Comparison *Daily* and *Monthly*; Aqua/AIRS Global *Daily* and *Monthly*; Aura High Resolution Dynamics Limb Sounder (HIRDLS); Aura Microwave Limb Sounder (MLS); Aura OMI Level 3 and Level 2G; MISR *Daily* and *Monthly*; Clouds and the Earth's Radiant Energy System (CERES FM4); Modern Era Retrospective-Analysis for Research and Applications (MERRA) 3D *Monthly* and 2D *Monthly*; MODIS Terra and Aqua *Daily* and *Monthly*; Earth Probe and Nimbus-7 TOMS; Tropospheric Emission Spectrometer (TES); Upper Atmosphere Research Satellite (UARS) Halogen Occultation Experiment (HALOE).
- **Environmental Instances:** Agriculture; Air Quality; Monsoon Asia Integrated Regional Study (MAIRS) *Monthly* and *8-Day*; Northern Eurasia Earth Science Partnership Initiative (NEESPI) *Daily* and *Monthly*
- **Ocean Instances:** Ocean Color Radiometry (SeaWiFS, MODIS, and derived and model products); Ocean Model *Daily* and *Monthly*.
- **Hydrology Instances:** Modern Era Retrospective-Analysis for Research and Applications (MERRA) 3D *Monthly*, 2D *Monthly*, *Monthly Analysis*, and *Chemical Forcing*; MODIS Terra and Aqua *Daily* and *Monthly*; Northern Eurasia Earth Science Partnership Initiative (NEESPI) *Daily* and *Monthly*; TRMM Online Visualization and Analysis System (TOVAS); Global Land Data Assimilation System (GLDAS) *Monthly*.

If you already know which instance to choose, please select it from the table below.

A-Train	Aerosol Daily	Aerosol Monthly	Agriculture	Air Quality
Aqua/AIRS Daily	Aqua/AIRS Monthly	Aura HIRDLS	Aura MLS	Aura OMI L3
Aura OMI L2G	CERES (FM4)	GLDAS Monthly	MAIRS Monthly	MAIRS 8-Day
MERRA MONTH 2D	MERRA MONTH 3D	MERRA_MONTH_ANA	MERRA_MONTH_CHM	MISR Daily
MISR Monthly	MODIS Daily	MODIS Monthly	NEESPI Daily	NEESPI Monthly
Ocean Color Radiometry	Ocean Model Daily	Ocean Model Monthly	TOMS	TRMM/TOVAS
TES	UARS HALOE			

Other services at GES DISC

- OPeNDAP
- WMS

OPeNDAP

GES DISC

Goddard Earth Sciences Data and Information Services Center

Your source for earth science data and information

You are here: [GES DISC Home](#) » [Services](#) » Data via OPeNDAP

DATA AVAILABLE VIA OPENDAP (DODS)

The Open Source Project for a Network Data Access Protocol (OPeNDAP [link](#)) provides remote access to individual variables within datasets in a form usable by many tools, such as [IDV](#) [link](#), [McIDAS-V](#) [link](#), [Panoply](#) [link](#), [Ferret](#) [link](#) and [GrADS](#) [link](#). Currently, the GES DISC offers the following datasets through OPeNDAP. (N.B.: not all OPeNDAP datasets work in all tools.)



[Atmospheric Infrared Sounder \(AIRS\) Moisture, Temperature, Cloud and Trace Gases](#)

Visible, infrared and microwave sensors provide daily global temperature profiles with accuracy of 1 K per 1 km thick layer in the troposphere and moisture profiles with accuracy of 20% per 2 km thick layer in the lower troposphere (20-60% in the upper troposphere). Version 5 also includes profiles of CO and CH₄ in addition to total column of ozone, CO and water vapor, cloud height and cloud fraction, and other atmospheric dynamic parameters



[Microwave Sounding Unit \(MSU\) Deep Layer Temperatures and Ocean Precipitation Data](#)

Deep layer temperatures and oceanic precipitation rates derived from 16 years of measurements taken by the Microwave Sounding Unit (MSU) flown aboard NOAA's Polar-Orbiting Operational Satellites (POES).



[Tropical Rainfall Measuring Mission \(TRMM\) Gridded Rainfall Data](#)

TRMM is dedicated to measuring tropical and subtropical rainfall through microwave and visible infrared sensors, and includes the first space borne rain radar. The TRMM orbit is circular, non-sun-synchronous, at an altitude of 350 km and an inclination of 35 degrees to the Equator, providing extensive coverage in the tropics.



[Total Ozone Mapping Spectrometer \(TOMS\) Daily Global Gridded Data](#)

Since 1978 TOMS has been flown on number of spacecrafts for monitoring global and regional trends in total ozone. It has provided long-term (over 25 yrs) continuous record of total ozone. TOMS also provided measurements of atmospheric aerosols, volcanic SO₂, ultraviolet irradiance, erythral UV exposure, and effective surface reflectivity.



[Ozone Mapping Instrument \(OMI\) Daily Global Gridded Data](#)

OMI is a Dutch instrument flown (July 2004) on the EOS-Aura spacecraft (equator around 1:30 P.M. in ascending mode) to continue the monitoring of global and regional ozone. OMI also provides five major atmospheric pollutants:

Tropospheric Ozone, Nitrogen Dioxide, Sulfur Dioxide, Aerosols, Formaldehyde in addition to BrO, Erythral surface UV-radiation and Clouds.

WMS

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+ AIRS

+ MODELING

+ MAIRS

+ MEASURES

+ PRECIPITATION

GES DISC




Goddard Earth Sciences Data and Information Services Center

You are here: [GES DISC Home](#) » [Services](#) » OGC Web Map Service

DATA AVAILABLE VIA OGC WEB MAP SERVICE

The Open Geospatial Consortium (OGC) Web Map Service (WMS) is an interface that allows the use of data and enables clients to build customized maps with data coming from a different network.

The GES DISC provides the following data through the WMS interface:

	Atmospheric Infrared Sounder (AIRS) Near-Real-Time BT_diff_SO2 (an indicator of volcanic SO2), RGB, and CO images are available for the near-real-time AIRS Calibrated Radiance data. WMS GetCapabilities...
	Atmospheric Infrared Sounder (AIRS) Data Products Visible, infrared and microwave sensors provide daily global atmospheric temperature moisture and trace gases throughout the atmosphere. AIRS WMS layers include surface temperature, total column ozone, CO and water vapor, cloud fraction, and other atmospheric dynamic parameters. WMS GetCapabilities...
	Tropical Rainfall Measurement Mission (TRMM) Gridded Rainfall Data The TRMM is the first mission dedicated to measuring tropical and subtropical rainfall through microwave and visible infrared sensors, and includes the first spaceborne rain radar. WMS GetCapabilities...
	Ozone Monitoring Instrument (OMI) Data Products The OMI employs hyperspectral imaging to observe solar backscatter radiation in the visible and ultraviolet. OMI WMS layers include total ozone and other atmospheric parameters related to ozone chemistry and climate. WMS GetCapabilities...

How does it work?

OGC WMS interacts with their clients via the HTTP protocol. In most cases, a WMS is a CGI program. The WMS specification defines a number of request types, and for each of request type it defines a set of query parameters and associated behaviors. Listed below are the requests available from the WMS:

Future plans:

- TRMM Version 7 (data, TOVAS, documentation update, etc.)
- Add TRMM Composite Climatology (1998-2009) to TOVAS
- GPM (to be launched on July 21, 2013)

URLs:

- TOVAS: <http://disc2.nascom.nasa.gov/Giovanni/tovas/>
- HDAT: <http://disc.sci.gsfc.nasa.gov/HDAT>
- YOTC: <http://disc.sci.gsfc.nasa.gov/YOTC>
- Mirador: <http://mirador.gsfc.nasa.gov/>
- Giovanni: <http://disc.sci.gsfc.nasa.gov/giovanni>
- OPeNDAP, WMS: <http://disc.sci.gsfc.nasa.gov/services>
- GES DISC: <http://disc.sci.gsfc.nasa.gov/>

Contact: Zhong.Liu@nasa.gov